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REMARKS

Claims 1 through 19 and new Claims 20 and 21 are pending in the application.

Claim 1 has been amended to reflect the advantageous incorporation of crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate. Support for this amendment can be found in the Application-as-filed, for example on Page 4, second full paragraph in its entirety.

Claim 1 has further been amended to reflect the advantageous incorporation of only soluble flame retardant(s) within the films of the invention. Support for this amendment can be found in the Application-as-filed, for example on Page 5, fourth full paragraph, second sentence.

Claim 19 has been amended to emphasize advantageous embodiments in which the film is formed from polyester consisting of polyethylene terephthalate. Support for this amendment can be found in the Application-as-filed, for example on Page 4, second full paragraph, second sentence.

Claims 20 and 21 have been added to complete the record for examination and highlight advantageous embodiments of the invention.

Claim 20 is directed to particularly advantageous films of the invention incorporating flame retardant consisting of one or more compounds dissolved within the polyester, with the resulting films exhibiting a modulus of elasticity in the machine direction of greater than 3200 N/mm^2 after being exposed to temperatures of 100°C for 100 hours. Support for Claim 20 can be found in the Application-as-filed, for example on Page 5, fourth full paragraph, second sentence; Page 3, fourth full paragraph in its entirety and Page 4, first full paragraph in its entirety.

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Claim 21 is directed to particularly beneficial films of the invention in which the flame retardant(s) consist of organic phosphorus compounds and the film complies with the requirements for construction material classes B2 and B1 to DIN 4102. Support for Claim 21 can be found in the Application-as-filed, for example on Page 5, fourth full paragraph, first sentence and Page 8, third full paragraph in its entirety.

Applicants respectfully submit that this response does not raise new issues, but merely places the above-referenced application either in condition for allowance, or alternatively, in better form for appeal. Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

The Claimed Invention is Patentable in Light of the Art of Record

Claims 1 through 4, 6 through 12 and 14 through 19 stand rejected over United States Patent No. 5, 955, 181 to Peiffer et al. (US 181) in view of United States Patent No. 5,936,048 to Oishi et al. (US 048) and United States Patent No. 5,804,626 to Rogers et al. (US 626). Claims 5 and 13 stand rejected over the foregoing primary and secondary references and further in view of DE 19630599 to Murschall (DE 599).

It may be useful to consider the claims as amended before addressing the merits of the rejection. The claims are directed to transparent, biaxially oriented films formed from crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate. The claimed films further include one or more flame retardant(s), each of which is soluble in the polyester. The flame retardant is incorporated into the films as a predried and/or precrystallized masterbatch.

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Quite unexpectedly in light of conventional flame retardant films, the polyester films of the invention do not embrittle when exposed to temperatures of 100 °C for 100 hours. Nor do the films of the invention overly soften at such elevated temperatures. Instead, the films of the invention advantageously exhibit a modulus of elasticity in the machine direction of greater than 3200 N/mm² after being exposed to temperatures of 100 °C for 100 hours, as recited in Claim 20.

The films of the invention may be used in a number of applications, including as illuminated advertising profiles and in construction applications. (The Examiner's attention is kindly directed to the Application-as-filed on Page 11, third full paragraph in its entirety.)

Applicants respectfully reiterate that the cited references do not teach or suggest the claimed invention.

US 181 is directed to heat-sealable packaging films having a reduced tendency to stick during production and further processing. (Col. 1, lines 18 through 24 and Col. 2, lines 50 - 56). US 181 discloses the incorporation of ethylene 2,6-naphthalate ("EN") into the heat-seal layer of packaging films to improve the sticking properties of the resulting films. (Col. 3, lines 29 - 32 and lines 45 - 50 and Col. 5, lines 11 - 13). US 181 thus requires the presence of from 5 to 95 wt % EN within at least one layer of its films. (Col. 5, lines 10 - 17). As correctly noted by the Examiner, US 181 generically notes that any of the film layers may further contain "conventional additives." US 181 then goes on to broadly describe the additives as being present in "the usual amounts." (Col. 6, lines 49 - 54). In addition to heat sealability, US 181 further notes that its films may be easily embossed, i.e. the films of US 181 readily soften, upon exposure to temperatures above 90 °C. (Col. 8, lines 39 - 42).

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US 181, requiring the presence of EN, does not teach or suggest the advantageous films of the invention, formed from crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate. US 181 instead strongly teaches away from such films.

Applicants further respectfully reiterate that US 181, directed to improved packaging films, does not teach or suggest the flame retardant films of the invention. And US 181 most certainly does not teach or suggest flame retardant films including from 0.5 to 30.0% by weight of flame retardant, as recited in Claim 6. Nor does US 181 teach or suggest that such films comply with the requirements for construction material classes B2 and B1 to DIN 4102, as recited in Claims 18 and 21.

Nor does US 181 teach or suggest films exhibiting a modulus of elasticity in the machine direction of greater than 3200 N/mm² after being exposed to temperatures of 100 °C for 100 hours, as recited in Claim 20. US 181 instead teaches away from such embodiments by noting that its the heat-sealable films soften upon exposure to temperatures above 90 °C.

Accordingly, Applicants respectfully submit that Claims 1 through 21 are patentable in light of US 181, considered either alone or in combination with the remaining art of record.

US 048 imparts flame retardance to resins by bonding a norbornenyl-group onto the polymer chain. (Col. 4, lines 31 – 42; Col. 7, lines 60 – 66 and Col. 34, lines 45 - 50). The norbornenyl group may be bonded to the resin in amounts of up to 60 wt %. (Col. 15, lines 48 – 51). US 048 makes a clear distinction between blend additives that are merely physically combined with the final resin prior to article manufacture versus components that are chemically bonded to the resin during polymer production. For example, US 048 notes that blend additives are subject to sublimation, bleeding and the like. (Col. 3, line 35 – Col. 4, line 12). US

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048 does note the use of additional blend additives to impart "further improved flame retardancy." (Col. 4, lines 60 – 65). US 048 expressly notes, however, that "the effect is insufficient" when phosphorus-containing blend additives are used alone as flame-retardants. (Col. 3, lines 48 – 50).

Applicants respectfully reiterate that although providing a laundry list of suitable resins, US 048 appears primarily directed to polypropylene and styrene resins. (Col. 28, lines 38 – 40). US 048 similarly provides a laundry list of suitable applications. (Col. 20, lines 31 – 56). Although a wide range of molded product applications are specifically enumerated, biaxially oriented films are noticeably absent from the list. US 048 further provides a myriad of working examples; however, none is directed to either biaxially oriented film or polyethylene terephthalate. (Ex. 1, Col. 38, line 45 – Ex. 79, Col. 64, line 47).

Accordingly, Applicants respectfully reiterate that US 048 does not teach or suggest the recited flame retardant biaxially oriented films. And US 048 most certainly does not teach or suggest such films in which the entirety of the flame retardant is soluble within the polyester, as provided in the claims as amended. Instead, US 048 teaches away from such films by requiring a flame retardant that is chemically bonded to the polymer chain.

Nor does US 048 teach or suggest that such soluble flame retardants result in films exhibiting a modulus of elasticity in the machine direction of greater than 3200 N/mm² after being exposed to temperatures of 100°C for 100 hours, as recited in Claim 20. And US 048 most certainly does not teach or suggest films in which the soluble flame retardants consist of organic phosphorous compounds and the films comply with the requirements for construction material classes B2 and B1 to DIN 4102. US 048 instead teaches away from such embodiments by expressly noting that "the effect is insufficient" when phosphorus-containing additives are used alone as flame-retardants.

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Accordingly, Applicants respectfully submit that Claims 1 through 21 are likewise patentable in light of US 048, considered either alone or in combination with the remaining art of record.

US 626 is directed to polyethylene naphthalate compositions having improved hydrolytic stability. (Col. 2, lines 53 – 56). US 626 expressly notes that its polyesters suffer from “reduced heat resistance.” (Col. 7, lines 3 – 4). Further, although broadly noting a number of applications, US 626 is primarily directed to monofilaments used to form paper machine fabrics. (Col. 7, lines 50 – 54).

US 626, requiring the presence of polyethylene naphthalate, does not teach or suggest the recited films formed from crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate. US 626 instead teaches away from such films.

Nor does US 626 teach or suggest flame retardant films including from 0.5 to 30.0% by weight of flame retardant, as recited in Claim 6. US 626 further does not teach or suggest flame retardant films that comply with the requirements for construction material classes B2 and B1 to DIN 4102, as recited in Claims 18 and 21. US 626 likewise does not teach or suggest flame retardant films exhibiting a modulus of elasticity in the machine direction of greater than 3200 N/mm² after being exposed to temperatures of 100 °C for 100 hours, as recited in Claim 20.

Accordingly, Applicants respectfully submit that Claims 1 through 21 are also patentable in light of US 626, considered either alone or in combination with the remaining art of record.

Applicants respectfully submit that there would have been no motivation to have ever looked to the cited references. In particular, the primary reference is

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directed to packaging films having improved sticking properties. The present invention is directed to flame retardant films used in illuminated advertising, construction applications and the like. Applicants respectfully submit that these are altogether different fields of endeavor and problems solved.

Applicants further respectfully reiterate that there similarly would have been no motivation to have combined US 181, US 048 and US 626. US 181 is directed to packaging films having improved sticking properties. US 048 is directed to molded products formed from norbornenyl-containing polymers. US 626 is primarily directed to monofilaments used in paper machine fabric that exhibit improved hydrolytic stability. Applicants respectfully submit that these are likewise altogether different fields of endeavour and problems solved.

However, even if combined (which Applicants submit should not be done), the claimed invention would not result. US 181 is directed to films incorporating EN. US 626 is similarly directed to PEN compositions. US 048 is directed to polymers bonded to a particular flame retardant. Consequently, even if combined, the recited films formed from crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate that further include one or more soluble flame retardant(s) would not result.

Nor would the combination result in such flame retardant films including from 0.5 to 30.0% by weight of flame retardant, as recited in Claim 6. The combination similarly does not teach or suggest such films complying with the requirements for construction material classes B2 and B1 to DIN 4102 as recited in Claim 18, and particularly not such films including the flame retardants recited in Claim 21. And the combination most certainly does not teach or suggest that film containing the recited soluble flame retardant(s) exhibits a modulus of elasticity in the machine direction of greater than 3200 N/mm² after being exposed to temperatures of 100 °C for 100 hours, as provided in Claim 20.

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Accordingly, Applicants respectfully submit that Claims 1 through 21 are patentable in light of US 181, US 626 and US 048, considered either alone or in combination.

Claims 5 and 13 are similarly patentable in light of the foregoing references in combination with DE 599.

Applicants respectfully reiterate that DE 599 is solely directed to cast sheet, not the biaxially oriented films of the claimed invention. DE 599 is more particularly directed to cast sheet that includes antioxidant.

Applicants likewise respectfully reiterate that there would have been no motivation to have combined US 181, US 048, US 626 and DE 599. As noted above, US 181 is directed to packaging films having improved sticking properties. US 048 is directed to molded products formed from norbornenyl-containing polymers. US 626 is primarily directed to monofilaments used in paper machine fabric that exhibit improved hydrolytic stability. DE 599 is directed to cast sheet including antioxidants. Applicants respectfully submit that these are altogether different fields of endeavour and problems solved.

However, even if combined (which Applicants submit should not be done), the claimed invention would not result. US 181 is directed to films incorporating EN. US 626 is similarly directed to PEN compositions. US 048 is directed to polymer bonded to a particular flame retardant. DE 599 is directed to cast sheet. Consequently, even if combined, the recited biaxially oriented films formed from crystallizable thermoplastic consisting of at least one of either polyethylene terephthalate or polybutylene terephthalate that further include one or more soluble flame retardant(s) would not result.

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Accordingly, such films further including the enumerated hydrolysis stabilizers of Claim 5 would not result. Likewise, the films of Claim 13, incorporating recycled material, would not result.

Applicants thus respectfully submit that Claims 5 and 13 are patentable in light of US 181, US 048, US 626 and DE 599, considered either alone or in combination.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1 through 21 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

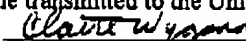
It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,



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I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office to (703) 872-9306 on March 3, 2005.  Claire Wygand